

Xiurui Zhao (赵修瑞)

1200 East California Blvd
Pasadena, CA, 91125
Website: <https://xiurui.github.io>
Email: xiurui.zhao.work@gmail.com

Research Interests

Active Galactic Nuclei, Extragalactic Surveys, Time-Domain Astrophysics

Fellowships & Appointments

California Institute of Technology, Pasadena, U.S.	2025-
Postdoctoral Scholar Research Associate, Advisor: Prof. Fiona Harrison, Dr. Daniel Stern	
California Institute of Technology, Pasadena, U.S.	2024 Fall
Visiting Scholar, Host: Prof. Fiona Harrison	
University of Illinois Urbana-Champaign, Urbana, U.S.	2023-2025
Postdoctoral Research Associate, Advisor: Prof. Yue Shen	
Center for Astrophysics Harvard & Smithsonian, Cambridge, U.S.	2021-2023
Postdoctoral Fellow, Advisors: Dr. Francesca Civano, Dr. Martin Elvis	
Center for Astrophysics Harvard & Smithsonian, Cambridge, U.S.	2020-2021
Pre-Doctoral Fellow, Advisor: Dr. Francesca Civano	

Education

Clemson University, Clemson, U.S.	2016-2021
Ph.D. in Astrophysics, Advisor: Prof. Marco Ajello	
Dissertation: <i>Heavily Obscured Active Galactic Nuclei in NuSTAR Era</i>	
Lanzhou University, Lanzhou, China	2012-2016
B.Sc. in Physics, Cuiying Honors College, China's Top-Notch Undergraduate Training Program	

Honors and Awards

Clemson University Level Outstanding Graduate Researcher (2 winners each year)	2021
Science College Outstanding Graduate in Discovery	2021
Physics Department Graduate Research Assistant	2021
SAO Predoctoral Fellowship	2020-2021
Clemson Graduate Student Travel Grant	2019, 2021
Cuiying Honors College Abroad Study Fellowship	2014, 2015

Accepted Scientific Proposals as PI

22 accepted X-ray/optical/sub-mm proposals with **\$450k** grant as PI.

● **X-ray (1.8 Ms)**

- **XMM-Newton** DDT (30 ks) **2025**
“First X-ray Survey on the JWST-NEXUS Field”
- **NuSTAR** Cycle 11 (100 ks *NuSTAR* + 28 ks *Swift*, ToO, \$80k) **2025**
“Probing the electron populations in AGN Corona with NuSTAR”
- **Swift**-XRT ToO (18 ks) **2025**
“Measure the current flux of eROSITA detected high-z quasars for NuSTAR follow-up”
- **NuSTAR** Cycle 9 (**Large**, 500 ks *NuSTAR* + 142 ks XMM, \$130k) **2023**
“Systematically Constraining the AGN Coronal Properties with NuSTAR Using a Sample of Luminous, High-redshift Quasars”
- **NuSTAR** Cycle 8 (**Large**, 600 ks *NuSTAR* + 195 ks XMM, \$150k) **2022**
“Constraining the Properties of AGN Coronae using a Sample of Luminous, High-redshift Quasars with NuSTAR”
- **NuSTAR** Cycle 7 (100 ks *NuSTAR* + 60 ks XMM, \$90k) **2021**
“Unveiling with NuSTAR the most powerful, heavily obscured, quasar ever discovered in X-rays”
- **Swift**-XRT Cycle 19 (18 ks) **2022**
“Build a Sample of Luminous, High-redshift Quasars to Constrain the Properties of AGN Coronae”
- **Swift**-XRT ToO (3 ks) **2021**
“Measure the X-ray flux of a rare coronal line event quasar exhibiting another optical flare”

● **Optical (9 nights)**

- **SOAR** 4m Goodman (0.6+0.6 night) **2024B/2025A**
“Identify X-ray Bright Quasars to Constrain the AGN Coronae”
- **BOK** 2.5m BCSpec (2 night), Co-PI **2024B**
“Redshifts of X-ray Bright Quasars to Constrain the AGN Corona”
- **MMT** 6.5m Hectospec (0.3+0.3 night, 335 sources) **2022B & 2023A**
“Complete the Hectospec Spectroscopic Survey of JWST NEP Time-Domain-Field”
- **MMT** 6.5m Binospec (0.1+0.1+0.2 night) **2022A & 2022B & 2023A**
Monitoring a Coronal Line Event AGN
- **MMT** 6.5m Binospec (0.4 night, 6 sources) **2023A**
Identify X-ray Bright Quasars and Constrain the AGN Coronal
- **SAO FLWO** 1.5m FAST (0.2 night) **2023A**
Measure the Black Hole Mass of an X-ray Bright Quasar to Constrain Its Coronal Properties
- **SAO FLWO** 1.2m Keplercam (1+1+2 night, g, r, i) **2023A & 2022B & 2022A**
“Monitoring the Continuous Optical Flares of a Coronal Line Event”

● **Sub-mm (3 tracks)**

- **Submillimeter Array** (SMA) standard science observation (3 tracks) **2022B**
“Monitoring with SMA a Highly Variable Flat Spectrum Radio Quasar in the JWST North Ecliptic Pole Time-Domain Field”

Collaboration & Professional Service

• Member of HEROIX AGN Working Group	2025-
• Member of Roman Science Collaboration	2025-
• Member of PRIMA AGN Across Cosmic Time Working Group	2025-
• Member of HEX-P Black Hole Growth & Corona Working Group	2022-
• Member of AXIS AGN & Time-Domain Working Group	2022-
• Member of JWST PEARLS Working Group	2022-
• Member of NuSTAR Extragalactic Survey Team	2020-
• Member of Athena AGN Science Working Group	2020-
- Co-organizers of CfA High Energy Astrophysics Division Seminar	2021-2023
+ Panelist for NASA NuSTAR , Swift Proposal Review	
+ External reviewer for CFHT	
+ Reviewer for ApJ, A&A	

Invited Talks

Clemson University, two Group Seminars	Apr 2025
Caltech, HEA Group Meeting	Dec 2024
Caltech, Tea Talk	May 2024
Caltech, HEA Group Meeting	May 2024
Zhejiang University, Colloquium	Sep 2023
Peking University, KIAA-DoA Seminar	Aug 2023
Tsinghua University, Departmental Seminar	Aug 2023
UIUC, local group meeting	May 2023
Yale University, Galaxy Lunch Talk	Apr 2023
MIT, Brown Bag Lunch Talk	Apr 2023
NASA GSFC, X-ray Astrophysics Laboratory AGN Seminar (Virtual)	Feb 2023
CfA, High Energy Seminar	Feb 2023
Arizona State University, Cosmology Seminar	Dec 2022
University of Arizona, Steward Observatory/NOIRLab Galaxy group seminar	Dec 2022
MIT, High Energy Astro Group seminar (Virtual)	Apr 2022
Clemson University, Local Group seminar	Apr 2022
INAF OAS, Bologna, X-ray group seminar	Sep 2019

Contributed Talks

AXIS Community Science Conference	Maryland, Apr 2025
High Energy Astrophysics Division 21th Meeting	Texas, Apr 2024
243st AAS Meeting	New Orleans, Jan 2024
High Energy Astrophysics Division 20th Meeting	Hawaii, Mar 2023

241st AAS Meeting	Seattle, Jan 2023
<i>NuSTAR</i> 2022 Conference	Italy, June 2022
New England Regional Quasar and AGN Meeting	Connecticut, May 2022
High Energy Astrophysics Division 19th Meeting (<i>Poster</i>)	Pittsburgh, Mar 2022
Black Hole Across Space and Time	Virtual, Dec 2021
238th AAS Meeting	Virtual, June 2021
237th AAS Meeting	Virtual, Jan 2021
Supermassive Black Holes Meeting	Virtual, Dec 2020
235th AAS Meeting	Honolulu, Jan 2020
X-ray Astronomy 2019 Meeting (<i>Poster</i>)	Bologna, Italy, Sep 2019
High Energy Astrophysics Division 17th Meeting (<i>Poster</i>)	Monterey, Mar 2019
233rd AAS Meeting	Seattle, Jan 2019

Mentoring & Assistant Experience

Co-supervision of Clemson graduate student R. Silver (NASA Postdoc Fellow)	2019-
Co-supervision of Clemson graduate student A. Pizzetti (ESO Fellow)	2019-2024
Co-supervision of Clemson undergraduate students D. Cole and Z. Hu	2019
Research Assistant, Clemson	2018-2020
Teaching Assistant (PHYS 2230), Clemson	2016-2017

Workshops & Schools

CSST summer school at Peking University	Beijing, China, July 2023
Summer School for Astrostatistics at Penn State	State College, Jun 2023
End-to-end Simulations with SIXTE Workshop	Virtual, Mar 2022
2022 Submillimeter Array Interferometry School	Virtual, Jan 2022
Winter School at University of Freiburg	Freiburg, Germany, Feb 2015
Summer School at University of California, Berkeley	Berkeley, Jun-July 2014

Press Release

Webb Glimpses Field of Extragalactic PEARLS, Studded With Galactic Diamonds	2022
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Outreach

- The Silk Road Cameleers Series (Introduce AGN to Undergrads) Remote, **Apr, 2024**
- † Volunteer to teach astronomy and mathematics to elemental and high school students in the rural area of China Qiajia, **Summer, 2023**
- † Translate Sensing Dynamic Universe project into Chinese (help people with visual disability accessible to the dynamic Universe with sonified astronomical light curves and spectra) **2022-2023**

References

- Marco Ajello, PhD supervisor, majello@g.clemson.edu
- Francesca Civano, postdoc supervisor, francesca.m.civano@nasa.gov
- Martin Elvis, postdoc co-supervisor, melvis@cfa.harvard.edu
- Stefano Marchesi, PhD co-supervisor, stefano.marchesi@inaf.it
- Yue Shen, postdoc supervisor, shenyue@illinois.edu
- Daniel Stern, postdoc co-supervisor, daniel.k.stern@jpl.nasa.gov

Publication List

A total of **33** peer-reviewed papers, **5** submitted papers [ADS](#)

- **First-author papers**

- 7) **X. Zhao**, S. Marchesi, M. Ajello, et al., 2024, ApJ, 975, 24
An X-ray Significantly Variable, Luminous, Type 2 Quasar at $z = 2.99$ with a Massive Host Galaxy
- 6) **X. Zhao**, F. Civano, C. N. A. Willmer, et al., 2024, ApJ, 965, 188
PEARLS: The NuSTAR and XMM-Newton extragalactic surveys of the JWST North Ecliptic pole Time-Domain Field II
- 5) **X. Zhao**, F. Civano, F. M. Fornasini, et al. 2021, MNRAS, 508, 5176
The NuSTAR extragalactic surveys of the JWST North Ecliptic pole Time-Domain Field
- 4) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2021, A&A, 650, A57
The properties of the AGN torus as revealed from a set of unbiased NuSTAR observations
- 3) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2020, ApJ, 894, 71
A broadband X-ray study of a sample of AGNs with [OIII] measured inclinations
- 2) **X. Zhao**, S. Marchesi, M. Ajello, 2019, ApJ, 871, 182
Compton-thick AGN in the NuSTAR Era. IV. A Deep NuSTAR and XMM-Newton View of the Candidate Compton-thick AGN in ESO 116-G018
- 1) **X. Zhao**, S. Marchesi, M. Ajello, et al. 2019, ApJ, 870, 60
Compton-thick AGNs in the NuSTAR Era. II. A Deep NuSTAR and XMM-Newton View of the Candidate Compton-thick AGN in NGC 1358

- **Significantly contributed papers and mentored students* paper**

- 13) *R. Silver, F. Civano, **X. Zhao**, Submitted to AAS journals
PEARLS: NuSTAR and XMM-Newton Extragalactic Survey of the JWST North Ecliptic Pole Time-Domain Survey III
- 12) *A. Pizzetti, et al. (including **X. Zhao**), 2025, ApJ, 979, 170
Hydrogen column density variability in a sample of local Compton-thin AGN II
- 11) F. Civano, **X. Zhao**, P. Boorman, et al., 2024, Front. Astron. Space Sci., 1340719
The High Energy X-ray Probe (HEX-P): X-ray population contributing to peak of the Cosmic X-ray background

- 10) E. Kammoun, et al. (including **X. Zhao**), 2024, Front. Astron. Space Sci., 1308056
The High Energy X-ray Probe (HEX-P): Probing the physics of X-ray corona in active galactic nuclei
- 9) N. Torres-Albà, M. Stefano, **X. Zhao**, et al., 2023, A&A, 678, A154
Hydrogen Column Density Variability in a sample of local Compton-thin AGN
- 8) *R. Silver, N. Torres-Albà, **X. Zhao**, et al., 2023, A&A, 675, A65
A New Mid-Infrared and X-ray Machine Learning Algorithm to Discover Compton-thick AGN
- 7) *R. Silver, N. Torres-Albà, **X. Zhao**, et al. 2022, ApJ, 940, 148
Compton-thick AGN in NuSTAR Era. IX: joint NuSTAR and XMM-Newton analysis of four local AGN
- 6) *A. Pizzetti, et al. (including **X. Zhao**), 2022, ApJ, 936, 149
A multi-epoch X-ray study of the nearby Seyfert 2 galaxy NGC 7479: Linking column density variability to the torus geometry
- 5) S. Marchesi, **X. Zhao**, N. Torres-Albà, et al. 2022, ApJ, 935, 114
Compton-Thick AGN in the NuSTAR era VIII: A joint NuSTAR-XMM-Newton monitoring of the changing-look Compton-thick AGN NGC 1358
- 4) *R. Silver, N. Torres-Albà, **X. Zhao**, et al. 2022, ApJ, 932, 43
Chandra Follow-up Observations of Swift-BAT-selected AGNs II
- 3) N. Torres-Albà, S. Marchesi, **X. Zhao**, et al. 2021, ApJ, 922, 252
Compton-thick AGN in NuSTAR Era VI: The Observed Compton-thick Fraction in the Local Universe
- 2) S. Marchesi, M. Ajello, **X. Zhao**, et al. 2019, ApJ, 882, 162
Compton-thick AGNs in the NuSTAR Era. V. Joint NuSTAR and XMM-Newton Spectral Analysis of Three "Soft-gamma" Candidate CT-AGNs in the Swift/BAT 100-month Catalog
- 1) S. Marchesi, M. Ajello, **X. Zhao**, et al. 2019, ApJ, 872, 8
Compton-thick AGNs in the NuSTAR Era. III. A Systematic Study of the Torus Covering Factor

- Co-author papers

- 18) S. Creech, et al. (including **X. Zhao**), Submitted to AAS journals
Spectral analysis of Hard X-ray Selected AGN in the NEP Field
- 17) I. Cox, et al. (including **X. Zhao**), Submitted to AAS journals
A systematic search for AGN obscuration variability in the Chandra archive
- 16) A. Banerjee, et al. (including **X. Zhao**), Submitted to AAS journals
Contemporaneous X-ray and Optical Polarization of EHSP Blazar H 1426+428
- 15) K. Imam, et al. (including **X. Zhao**), Submitted to AAS journals
Source Identification for the Swift-BAT 150 Month Hard X-ray Catalog using Observations from Soft X-ray missions
- 14) D. Sengupta, et al. (including **X. Zhao**), 2025, A&A, 697, A78
A Multi-Wavelength Characterization of the Obscuring Medium at the Center of NGC 6300
- 13) N. Torres-Albà, et al. (including **X. Zhao**), 2025, ApJ, 981, 91
Swift-XRT and NuSTAR Monitoring of Obscuration Variability in Mrk 477
- 12) I. Cox, et al. (including **X. Zhao**), 2025, ApJ, 979, 130
Chandra Follow-up Observations of Swift-BAT-Selected AGNs III

- 11) J. García, et al. (including **X. Zhao**), 2024, Front. Astron. Space Sci., 1471585
The High Energy X-ray Probe (HEX-P): Science Overview
- 10) N. S. Khatiya, et al. (including **X. Zhao**), 2024, ApJ, 971, 84
Characterizing the γ -ray Emission from FR0 Radio Galaxies
- 9) R O'Brien, et al. (including **X. Zhao**), 2024, ApJS, 272, 19
TREASUREHUNT: Transients and Variability Discovered with HST in the JWST North Ecliptic Pole Time Domain Field
- 8) P. Boorman, et al. (including **X. Zhao**), 2024, Front. Astron. Space Sci., 1335459
The High Energy X-ray Probe (HEX-P): Probing the circum-nuclear environment in AGN down to extremely low luminosities
- 7) I. Cox, et al. (including **X. Zhao**), 2023, ApJ, 958, 155
A simple method to predict N_H variability in active galactic nuclei
- 6) S. P. Willner, et al. (including **X. Zhao**), 2023, ApJ, 958, 176
PEARLS: JWST counterparts of micro-Jy radio sources in the Time Domain field
- 5) C. N. A. Willmer, et al. (including **X. Zhao**), 2023, ApJS, 269, 21
PEARLS: Near Infrared Photometry in the JWST North Ecliptic Pole Time Domain Field
- 4) Q. Yang, et al. (including **X. Zhao**), 2023, ApJ, 953, 61
Probing the Origin of Changing-look Quasar Transitions with Chandra
- 3) D. Sengupta, et al. (including **X. Zhao**), 2023, A&A, 676, A103
Compton-thick AGN in the NuSTAR Era IX: Analysis of seven local CT-AGN candidates
- 2) R. A. Windhorst, et al. (including **X. Zhao**), 2023, AJ, 165, 13
Webb's PEARLS: Prime Extragalactic Areas for Reionization and Lensing Science: Project Overview and First Results
- 1) A. Traina, et al. (including **X. Zhao**), 2021, ApJ, 922, 159
Compton-Thick AGN in the NuSTAR era VII: a joint NuSTAR, Chandra and XMM-Newton analysis of two nearby, heavily obscured sources